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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------------|-------------|----------------------|---------------------|------------------|
| 09/847,299 | 05/03/2001 | Harald Rust | 51374 | 5428 |
| 26474 | 7590 | 09/14/2004 | EXAMINER | |
| KEIL & WEINKAUF | | | BHAT, NINA NMN | |
| 1350 CONNECTICUT AVENUE, N.W. | | | ART UNIT | PAPER NUMBER |
| WASHINGTON, DC 20036 | | | 1764 | |

DATE MAILED: 09/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/847,299

Applicant(s)

RUST ET AL.

Examiner

N. Bhat

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8-21-2001, 7-22-02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The abstract of the disclosure is objected to because applicant is required to have the heading "Brief Description of the Drawings". This heading can be made on Page 7, Line 16. Applicant is requested to delete the sentence "In the accompanying drawings". Correction is required. See MPEP § 608.01(b).
2. Claims 4, 5, 6, 8, 9, and 10 are objected to because of the following informalities: In the above mentioned claims applicant has used "preferably" language which is a linking term which links a broad range or statement with a narrower range or statement. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) can be considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" or "preferably" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 4 recites the broad recitation that the dividing wall is constructed of plastic, and the claim also recites polytetrafluoroethylene (TEFLON), which is the narrower statement of the

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range/limitation. Applicant is suggested to delete the preferably language and draft a separate claim which includes the polytetrafluoroethylene. Similar changes are requested in claims 5, 6 and 8-10.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaibel et al.[5, 914,012].

Kaibel et al. disclose the invention substantially as claimed.

Kaibel et al. teach a dividing wall column for separating a multicomponent mixture comprising an d upper column region, an inflow section, and off take section and a lower column regions wherein the inflow section and the off take section are separated from one another laterally by a dividing wall fixed in the column and the dividing wall is located between the upper region and the lower column regions wherein

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the dividing wall is located longitudinally in the column body. Specifically, Kaibel et al. teach that the dividing wall has a special construction so that the dividing wall can be placed in a column with or without packings and does not have to be welded or fixed into the column. The dividing wall (3) is a structural element integrated into the packing (4) and is fixed to it. the wall thickness of the wall joined to the packing is approximately from 0.1 to 3, preferably from 1 to 2 mm, than would be the case with a fixed dividing wall in the column body. Kaibel et al. teach that the dividing wall (3) is made from about 1 to 10 mm longer than the packing (4) joined to it at the top and bottom ends and has a and additional sheet strip (5) which is from about 10 to 20 mm wide from about 0.1 to 2 mm thick.[Note Column 2, lines 30-50 and Figure 3]. As an alternative construction, Kaibel et al. teach providing a dividing wall by attaching the dividing wall loosely between the individual packings (4) as a loose sheet (3) from about 0.5 to 3mm preferably from 1 to 2 mm thick, which is shown in Figure 4. As a third alternative U-shaped guild rails (10) can be attached the column walls into which the dividing walls (3) are pushed into the rails as shown in Figure 6.[Note column 2, line 50 to Column 3, line 48]

However, Kaibel et al. does not teach the material of construction of the dividing wall nor that the dividing wall has a slightly over dimensional width and that there is a "friction fit" or the dividing wall is fixed in the column by exerting an elastic recovery force on the interior wall of the column.

Kaibel et al. teaches a number of ways which the dividing wall is attached to the column, first is by attaching to the packing within the column or using U-shaped guide

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rails or using a sprung sealing lip. Kaibel et al. teaches a method of retrofitting a column with a dividing wall, which provides better efficiency and separation of a multicomponent mixture and specifically teaches that the dividing wall is not fixedly attached to the column or does not require the wall to be welded to the column. Admittedly, Kaibel et al. does not teach the specific type of material of construction i.e., being partly elastic or plastic or being constructed of a chromium nickel containing stainless steel. To select a non-reactive stainless steel material or non-reactive plastic to be used in the construction of chemical separation or dividing wall columns for the separation of multicomponent hydrocarbon streams would have been obvious to one having ordinary skill in the art familiar with column design and basic chemical engineering as material selection is specifically taught to all chemical engineers and would have been obvious to one design chemical reactors/columns and separatory apparatus. With respect to using an over dimensional width and using elastic recovery force to fix the dividing wall on the interior wall of the column, this concept would have been obvious to one having ordinary skill in the art in light of the teachings Kaibel et al., wherein a sprung sealing lip and/or using the packing where there is provided a friction fit so that the dividing wall is fixed in the column and a seal is provided so that the components during distillation does not mix has been taught and suggested and to modify the dividing wall as claimed would have been obvious to one having ordinary skill in the art absent criticality in showing. With respect to the later edges of the dividing wall being chamfered with the angel of chamfer being from 20 to 60° this has been taught and shown in the Figures of Kaibel. Note With respect to the internal

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diameter of the column although not specifically recited, the dimensions of the dividing wall strip thickness and length have been taught and correspond with the dimensions claimed by applicant and it would have been obvious if not implicitly implied that the column diameter would be within the same range as claimed by applicant. It is maintained that when reading Kaibel et al. 5,914,012 applicant's invention has been taught and fairly suggested rendering the invention as a whole obvious to one having ordinary skill in the art at the time the invention was made.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ognisty et al. teaches a partitioned distillation column. The partition can be a planar wall but a curved or angled wall can be employed. The partition walls are preferably thermally insulated to minimize stresses induced by large temperature differentials in the co-joined stripping or absorption portions. The partition walls are connected to the column by welds. Kaibel et al.'819 teach a distillation column for separating a liquid mixture into a plurality of pure fractions, which includes providing a separation means in the longitudinal direction with the result that the distillation column is divided into a feed part and a take-off part. Giroux teaches a fractionation column which is provided with a feed inlet and three product outlets with the product outlets including an overhead vapor outlet, a bottoms liquid outlet and a side draw outlet. A generally vertical partition is portioned within the column in a central region between an upper and lower vapor-liquid contact tray and divides the central region into first and second chambers defined by the upper and lower trays, column shell and partition. Wright teaches a divided wall column which is used to provide a purified side-

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stream. Tragut et al. teach a distillation method for separating a material which is solid at ambient temperature from a lower boiling and lower melting point material and the apparatus to effect the separation which includes a divided wall column which makes it possible to isolate side products, i.e., intermediate boiling components in pure form from a multicomponent mixture. Steacy '350 and 515 teaches a dividing wall column fractionation trayed column which overcomes the problems generated by heat transfer through the vertical dividing wall by providing an isolation wall which thermally insulates the dividing wall and a control method for regulating the rate of vapor flow in the two adjacent sections of a dividing wall fractional distillation column. Van Zile et al. teach a dividing wall control system which comprises a ratio controller which divides the liquid flowing into the dividing wall section. The rate of return of overhead liquid to the column is set by monitoring the temperature in the top of the product dividing wall section and the sidecut product draw rate is set by monitoring a temperature in the bottom of the product dividing wall section.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



N. Bhat
Primary Examiner
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